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Exhibit - 2.2

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Chick-Fil-A Beaverton Site Acoustical Analysis

**Submitted By: Tobin Cooley, P.E.
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1001 SW 5th Ave
Suite 1100
Portland, OR 97204
503-241-5255

*Toll Free: 888-814-1221
www.listenacoustics.com*

1100 Dexter Ave N
Suite 100
Seattle, WA 98109
206-223-1390

Summary

Noise from typical operations at the Chick-Fil-A restaurant on Cedar Hills Blvd in Beaverton, Oregon will not exceed maximum permissible noise as defined by the Beaverton City Code and DEQ/OAR Division 35 with the implementation of noise mitigation techniques described in this report.

Background

Sound waves in air are created by varying pressure levels above and below that of the ambient pressure. Because the range of sound pressure levels significant to people is very large, it is convenient to express them on a logarithmic scale, in units of decibels (dB).

Noise is most often measured as an A-weighted sound level in units of decibels, symbolized as dBA. The A-weighting is a specific weighting filter in a sound level meter that corresponds approximately to the varying sensitivity of human hearing at the measured frequencies. Examples of noise levels typical of the urban environment include:

<i>Source</i>	<i>dBA</i>
Impact hammer on concrete at 25 feet	90
Outdoor amplified music at 50 feet	80
Noisy Urban Area	80
Freeway at a distance of 100 feet	70
Suburban Commercial Area	65
Social gathering in a small room	60
Normal conversation at 5 feet	50
Quiet Urban Area (average)	55
Quiet suburban neighborhood (average)	40
Rural background noise (no activity)	30

In free field conditions, i.e. far from any reflective surfaces, the sound pressure level from a noise source is expected to be reduced by 6 dB for every doubling of distance; this assumes that the distances are large enough that the noise source is seen as a point source from the receiver positions. Free field conditions typically do not exist in many practical situations, and environmental factors must also be taken into account when considering outdoor sound propagation, particularly over relatively long distances, which alter the actual distance sound reduction.

Some important measures used in this analysis are as follows:

- Equivalent-Continuous Sound Level, L_{eq} : A continuous (constant) level of sound in dBA over a given time period that has the same energy as a varying sound over the same time period.

- Exceedance Levels, L_{xx} : The measured sound level in dBA that is met or exceeded for a percentage of the measurement time, where the percentage of the measurement time is indicated by “xx.” For example, if the L_{25} value of a measurement period is stated as 55 dBA, the sound level during the measurement was at least 55 dBA for 25 % of the time; this would be 15 minutes in the case of a one hour measurement period.

Site Noise Criteria

The subject site is in Beaverton, Oregon, and is zoned commercial. The adjacency of interest in this study is the single residential property bordering the site to the South.

Beaverton City Code, Chapter 5.15 has been used as the basis for criteria used in the sound level analysis. Chapter 5.15 specifies maximum permitted noise levels based on the land uses, indicates exemptions to the maximum permitted noise levels, and discusses enforcement of the noise regulations.

The following are excerpts from Chapter 5.15 of the City Code applicable to the subject site:

- Section B states that sound occurring within a residential area between 10:00 PM and 7:00 AM cannot be above 50 dBA.
- Section E states that noise is prohibited in “Noise-Sensitive Areas. The creation of any unreasonably loud and raucous noise adjacent to any noise-sensitive area while it is in use, and which unreasonably interferes with the workings of the noise-sensitive area or which disturbs the individuals in the noise-sensitive area.”
- Section G calls out for commercial establishments adjacent to residential property to keep noise from being “plainly audible” on the receiver side of the nearest property line during the hours of 10:00PM to 7:00 AM.
- Section 5.15.035 A exempts vehicles on premises which are open to the public.
- Sound amplification (this may apply to the communication speaker) cannot be “unreasonably loud and raucous” between 10:00 PM and 7:00 AM Monday through Friday and between 10:00 PM and 10:00 AM on weekends.

Although not enforced, the Oregon DEQ Noise Code is also useful in establishing objective standards for noise. The DEQ code specifies maximum permitted noise levels based on the land uses, indicates exemptions to the maximum permitted noise levels, and discusses enforcement of the noise regulations.

The following is an excerpt from Oregon Administrative Rules OAR Division 35, section 340-035-0005

- (A) New Sources Located on Previously Used Sites. No person owning or controlling a new industrial or commercial noise source located on a previously used industrial or commercial site shall cause or permit the operation of that noise source if the statistical noise levels generated by that new source and measured at an appropriate measurement point, specified in subsection (3)(b) of this rule, exceed the levels specified in **Table 8**, except as otherwise provided in these rules. ...

TABLE 8
(340-35-035)

New Industrial and Commercial Noise Source Standards

Allowable Statistical Noise Levels in Any One Hour

7 am – 10 pm

L₅₀ – 55 dBA

L₁₀ – 60 dBA

L₁ – 75 dBA

10 pm – 7am

L₅₀ – 50 dBA

L₁₀ – 55 dBA

L₁ – 60 dBA

Recommended Criteria: Based on these sources for noise criteria, we recommend the objective design sound levels from the site not exceed L₅₀ 55 dBA during the day and 50 dBA at night at the closest residential property line to the noise source.

Sound Level Calculations

The operational activities considered in the noise study are listed below:

- Truck travel to and from the delivery doors;
- Drive-through communication speakers;
- Idling and moving cars in the drive-through;

Predicted noise levels from the activities noted above are predicted to the residential property to the South of the site. This location is shown in Figure 1 below.

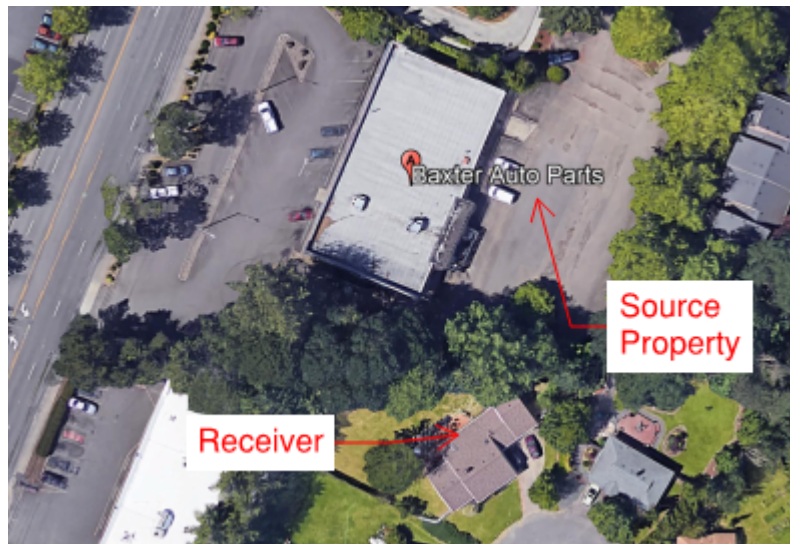


Figure 1: Receiver location -- adjacent residential property

Existing Ambient Noise Levels

Current ambient noise levels were studied on site at the closest property lines to the residence on the South property line. We measured samples during daylight and evening hours from 7:00 AM to 11:00 PM. The sound levels measured are as follows:

Receiver Location	Leq Ambient Sound Level at Property line, day	Leq Ambient Sound Level at property line night
South Residential Property Line	56 dBA	55 dBA

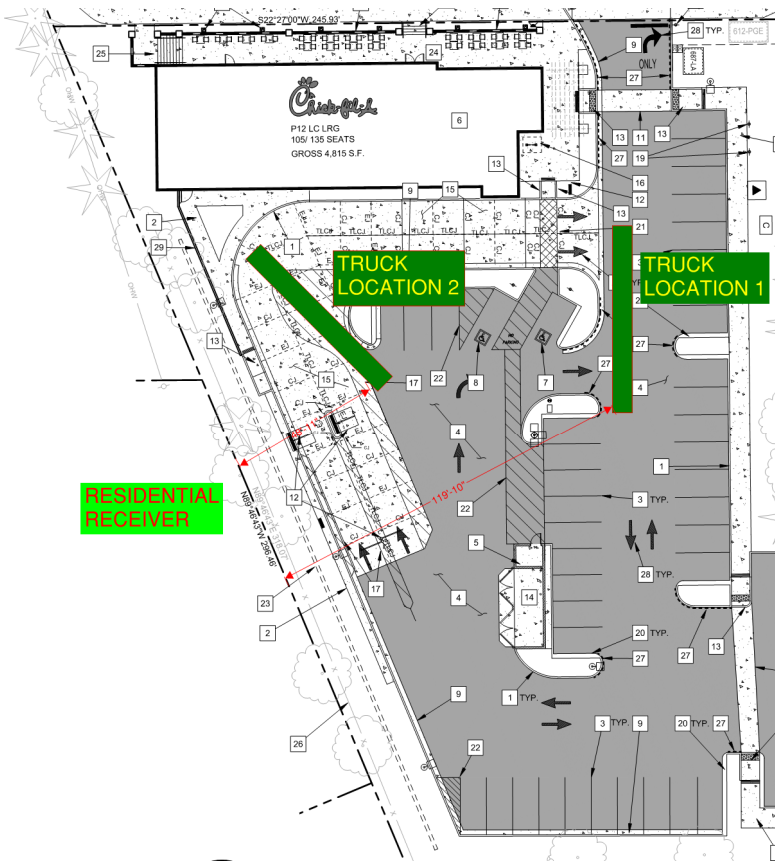
Table 1: Existing measured ambient sound levels day and night.

Note that in the ambient sound levels are above the 50 dBA Code limit on nighttime sound levels, even prior to the site being developed as planned.

Truck Travel and Idling of Truck Engines at Delivery Doors

A full size WB67 delivery truck with 53' trailer will be used for deliveries ~~a maximum of~~ typically one time daily. The truck engine noise level used in the analysis is 85 dBA L_{eq} at a distance of 50 feet; this level is based on truck noise measurements conducted by our firm, and confirmed by ODOT and AASHTO published data.

The trucks are expected to drive from Cedar Hills Blvd to either of two delivery locations shown below to get to the loading door area. The two truck parking areas are shown below, with Truck Location 1 being the most common. A typical delivery schedule involves a single truck delivery in a 24-hour period. The analysis of this study involves a worst-case scenario for noise potential, which would be that the delivery occurs during the hours of 5:00 AM to 7:00 AM.



The drive time to these locations once on site is a maximum duration of three (3) minutes, at 5 MPH. After being put into park, a truck engine will not be allowed to idle. It takes approximately 20 minutes to unload a truck. The refrigeration unit, if the trailer is so equipped, will remain on during the delivery.

With the current configuration of the loading area and operations as described above, noise levels for typical operations are as indicated in Table 2. The metric shown, L_{50} , is the maximum level exceeded no more than 30 minutes in one hour. This analysis assumes no sound barriers.

Truck Location	Receiver Location	Predicted worst case 1 hour L_{50}	Leq Ambient Sound Level at Location
1	South Residential Property Line	56 dBA	56 dBA
2	South Residential Property Line	60 dBA	56 dBA

*Table 2: Predicted levels due to pulling
into ~~and idling at~~ loading areas.*

It can be seen from the table that noise levels from Location 2 exceed the nighttime noise maximum of 50 dBA, as well as the current ambient sound levels from Location 2. Further mitigation is necessary for this truck location, as described below.

Back-Up Alarms

These signal levels will only occur momentarily, and as such, do not contribute significantly to the overall hourly noise levels at the receiver points of interest. As warning devices, these alarms are exempt per City Code in sections 5.15.030 H and 5.15.035, and DEQ due to the short-term nature of the device (less than 10 seconds).

Drive-Through Communications System Sound

Two drive-through speaker stations are shown in the plans. The speaker used in taking drive-through food orders is located on a podium wall, facing North, away from the residence to the South. The speaker is directional, meaning the speaker sound is significantly reduced to the South.

Sound levels were calculated at the residential receiver, based on using actual on site maximum occupancy (lunch hour) measurements at CFA sites in Oregon (Clackamas and Hillsboro). The sound level measured at these locations was 67 dBA at 10' in front of the speaker, for typical sound levels while communicating with patrons in cars through the speaker.

The resulting receiver sound levels are summarized as follows, assuming no sound mitigation:

Receiver Location	Predicted worst case 1 hour L₅₀	Leq Ambient Sound Level at Location
South Residential Property Line	61 dBA	56 dBA

*Table 3: Predicted level due
to the communication system.*

The level at the South residential property line is calculated to be above the ambient sound level and above the maximum daytime target of 55 dBA L₅₀, which requires sound reduction mitigation measures, described below.

Drive-Through Vehicle Idling and Travel

The vehicles in line for the drive-through travels at low speed to the cue line and wait with engines idling. From previous studies of CFA facilities, we understand there are typically up to 20 cars waiting in line at peak hours. We have used these peak automobile hours to calculate sound levels, which is the worst-case scenario.

Sound levels were calculated at the South residential receiver, based on typical passenger car and passenger truck idling and slow movement. The resulting receiver sound levels are summarized as follows, assuming no sound mitigation:

Receiver Location	Predicted worst case 1 hour L₅₀	Leq Ambient Sound Level at Location
South Residential Property Line	58 dBA	56 dBA

*Table 4: Predicted levels due to vehicles
idling in cue line
(highest vehicle traffic hour)*

Combined Predicted Noise Levels

The combined predicted noise levels due to vehicle travel, idling, and communications devices are given in Table 5. This combined predicted level assumes the worst-case scenario for each of the noise sources as described above.

Receiver Location	Predicted worst case 1 hour L_{50}	Leq Ambient Sound Level at Location
South Residential Property Line	62 dBA	56 dBA

Table 5: Combined worst-case predicted levels due to vehicles and communications

As indicated in Table 5, the new noise levels are predicted to exceed the limits at the receivers. Additional mitigation is recommended as described below:

Mitigation Recommendations

Mitigation includes adding a sound barrier near the **East and** South property lines (**clarification: the South property line extends to the East, and the barrier should extend to this line**). This barrier should be at least 7' tall above grade and should be placed such that the bottom of the barrier is at the same level as the drive path grade to ensure effectiveness.

A sketch of the barrier extents is shown below:



The barrier should be constructed of a material which attenuates sound sufficiently. The objective metric for this assessment is the Sound Transmission Class (STC) of the material. The barrier material STC should be not less than STC 21 to be effective.

Examples of materials which meet this STC 21 minimum include:

1. Concrete masonry (CMU) blocks not less than 4” thick;
2. Tongue and groove wood sealed tightly, not less than 1” thick;
3. Acoustical barrier material such as Kinetics KNM 100-B (rated STC 26) attached to a fence structure, and sealed air tight top, sides and bottom for the entire length of the fence.
4. Tilt up or poured in place concrete wall not less than 4” thick;
5. A pre-fabricated panelized barrier system such as Kinetics NoiseBlock wall system;

The barrier itself must seal tightly to the ground and to the corner of the building, should be continuously sealed (no gaps) from top to bottom, and should include horizontal extents which prevent sound from flanking around the ends of the barrier to the receiver.

Results with Mitigation

Mitigated Combined Predicted Traffic and Communication Noise Levels

The combined predicted noise levels from drive-through traffic moving, drive-through traffic idling and the communications devices with the mitigation described above are given in Table 6. This combined predicted level assumes the worst-case scenario for each of the noise sources as described above.

Receiver Location	Predicted worst case 1 hour L₅₀	Target Maximum L₅₀	Leq Ambient Sound Level at Location
South Residential Property Line	49 dBA	55 dBA (day)	56 dBA

Table 6: Mitigated combined worst-case predicted levels due to vehicles and drive through communications

As shown in the table above, the combined predicted noise levels at the neighboring properties will not exceed the maximum targets. Note the site ambient levels will be above these predicted levels, as described above in the ambient site measurements section.

Mitigated Truck Noise Levels

The combined predicted noise levels from truck travel and loading with the mitigation described above are given in Table 7.

Truck Location	Receiver Location	Predicted 1 hour L₅₀, (dBA)	Target Maximum L₅₀	Leq Ambient Sound Level at Location
1	South Residential Property Line	47 dBA	50 dBA	56 dBA
2	South Residential Property Line	50 dBA	50 dBA	56 dBA

Table 7: Predicted levels due truck delivery.

As shown in the table above, the combined predicted noise levels at the neighboring property will not exceed the maximum targets.

Summary

Noise from typical operations at the Chick-Fil-A on Cedar Hills Blvd will not exceed maximum permissible noise as defined by the City of Beaverton and Oregon DEQ Code with the implementation of noise mitigation techniques described in this report.

If there are any questions, or if we can provide further information, please do not hesitate to call.

Sincerely,
LISTEN ACOUSTICS



Tobin Cooley, P.E.
President

